



PART 1

DELAWARE LEVEL 2, 3, & 4 INTERCONNECTION APPLICATION & AGREEMENT

With Terms and Conditions for Interconnection
(Review of Small Generator Facilities Less Than or Equal to 10 MW³)

(Application & Conditional Agreement – to be completed prior to installation)

INTERCONNECTION CUSTOMER CONTACT INFORMATION

Customer Name: Michael Galanda

Mailing Address: 44 Sioux Dr. F16

City: Millsboro State: DE Zip Code: 19966

Contact Person/Authorized Agent (If other than above): _____

Mailing Address (If other than above): _____

Telephone (Daytime): (570) 407-1157 (Evening): _____

Fax Number: _____ E-Mail Address (Required): beach2141@hotmail.com

Alternate Project Contact Information: (if different from Customer-Generator above)

Alternate Name: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Telephone (Daytime): _____ (Evening): _____

Fax Number: _____ E-Mail Address: _____

If an email is provided for your alternate contact, that contact will receive all email communications.

FACILITY INFORMATION

Facility Address: 44 Sioux Dr. F16

City: MILLSBORO State: DE Zip Code: 19966

DPL Account #: 55012158691 Meter #: 1ND040473575 (Required by DPL)

Current Annual Energy Consumption (optional): 18000 kWh

Check if this Facility (building) is, or is going to be, NEW CONSTRUCTION: ☐

³ Up to 2 MW for Net Energy Metering.

Requested Procedure Under Which to Evaluate Interconnection Request:⁴

Please indicate below which review procedure applies to the interconnection request.

- ☒ **Level 2** - Certified interconnection equipment with an aggregate electric nameplate capacity less than or equal to 2 MW. Indicate type of certification below. (Application fee amount is \$50 plus \$1 per KW).
- ☒ Lab certified - tested to IEEE 1547.1 and other specified standards by a nationally recognized testing laboratory and is appropriately labeled.
- ☐ Field approved – identical interconnection has been approved by an EDC under a Level 4 study review process within the prior 36 months of the date of this interconnection request.
- ☐ **Level 3** – Small generator facility does not export power. Nameplate capacity rating is equal to less than 50KW if connecting to area network or equal to or less than 10 MW if connecting to a radial distribution feeder. (Application fee amount is \$100 plus \$2 per KW).
- ☐ **Level 4** – Nameplate capacity rating is less than or equal to 10 MW and the small generator facility does not qualify for a Level 1, Level 2 or Level 3 review or, the small generator facility has been reviewed but not approved under a Level 1, Level 2 or Level 3 review. (Application fee amount is \$100 plus \$2 per KW, to be applied toward any subsequent studies related to this application).

Field Approved Equipment:

If the field approved equipment box is checked above, please provide the estimated completion date in the section that follows, then sign the application and return it with the following information that is required for review of Level 2 field approved small generator facilities:

- A copy of the certificate of completion for the previously approved small generator facility,
- A written statement indicating that the interconnection equipment being proposed is identical, except for minor equipment modification, to the one previously approved.

Note: You do not have to complete the rest of the application if field approved equipment is being proposed.

Intent of Generation:

- ☒ Net Meter (Unit will operate in parallel and will export power pursuant to the Net Energy Metering Rider)
- ☐ Aggregated Net Meter (Unit will operate in parallel and will export power pursuant to the Aggregated Net Energy Metering Rider)
- ☐ Community Energy Facility (Unit will operate in parallel and will export power pursuant to the Community Energy Facility Rider)
- ☐ Cogeneration and Small Power Production (Qualifying Facility – Rate X or Rate EP)
- ☐ Wholesale Market Transaction (Unit will operate in parallel and participate in PJM market(s) pursuant to a PJM Wholesale Market Participation Agreement)
- ☐ Offset Partial Load (Unit will operate in parallel, but will not export power at any time to EDC)
- ☐ Back-up Generation (Units that temporarily parallel for more than 100 milliseconds) (Note: Backup units that do not operate in parallel for more than 100 milliseconds do not need an interconnection agreement.)

⁴ **Note:** Descriptions for interconnection review categories do not list all criteria that must be satisfied. For a complete list of criteria, please refer to the Delaware Standard Small Generator Interconnection Procedures, Title 26 - Public Utilities – Chapter 10. Electric Utility Restructuring §1014.

Estimated Commissioning Date: 05/06/2016

Energy Source: Solar PV Prime Mover: Photovoltaics

Type of Application: Initial ☒ Addition/Upgrade ☐ ⁵

Initial Rating: DC Generator Total⁶ Nameplate Rating: 15.105 (kW),
AC Inverter Total⁷ Rating 15 (kW),
AC System Design Total Capacity⁸: 15 (kW) 15000 (kVA)

Added Rating (if upgrade): DC Generator Total Nameplate Rating: _____ (kW),
AC Inverter Total Rating _____ (kW),
AC System Design Total Capacity: _____ (kW) _____ (kVA)

Total Rating (if upgrade): DC Generator Total Nameplate Rating: _____ (kW),
AC Inverter Total Rating _____ (kW),
AC System Design Total Capacity: _____ (kW) _____ (kVA)

Generator (or PV Panel) Manufacturer, Model #⁹: SolarWorld 285w MONO

A copy of Generator nameplate and Manufacturer's Specification Sheet may also be submitted

Number of Generators (or PV Panels): 53

Type of Tracking if PV: Fixed ☒ Single Axis ☐ Double Axis ☐

Array Azimuth: 229 / 220 ° Array Tilt: 23 / 14 °

Shading Angles at E,120°,150°,S,210°,240°,W: _____ ° (Separate with commas)

Inverter Manufacturer¹⁰: Fronius Model Number(s) of Inverter ¹¹: PRIMO 15.0

Number of Inverters¹²: 1 Inverter Type: Forced Commutated ☐ Line Commutated ☐

Ampere Rating: 62.5 Amps_{AC}, Number of Phases: ☒ 1 ☐ 3

Nominal Voltage Rating: 240 V_{AC}, Nominal DC Voltage: 406.9 V_{DC},

Power Factor: 100 %, Frequency 60 Hz, Efficiency: 96 (%)

DPL Taggable, Lockable, Accessible Disconnect¹³: ☐ Yes ☒ No,

If Yes, Location: _____

One-line Diagram Attached (Required): ☒ Yes ☐ No,

Site Plan Attached (Required): ☒ Yes ☐ No

Do you plan to export power?¹⁴ ☒ Yes ☐ No, If Yes, Estimated Maximum: 12 kW_{AC}

Estimated Gross Annual Energy Production: 18353 kWh

⁵ Initial if first time generator request. Addition/Upgrade if this is an add-on to a previously approved system.

⁶ Sum of all generators or PV Panels

⁷ Sum of all inverters

⁸ This will be your system design capacity based upon your unique system variables.

⁹ If more than one type, please list all manufactures and model numbers.

¹⁰ If more than one manufacture, please list all.

¹¹ If more than one model number, please list all.

¹² Attach additional sheets as necessary in the event of multiple inverters of various types/sizes

¹³ This is strongly recommended by the utility. Best practice is to have an externally accessible, lockable, disconnect with visible open/close connection and to have appropriate signage on the disconnect, such as 'Solar PV AC Disconnect' (preferably red) and on the meter housing 'Caution, Solar Electric System' (preferably yellow). If the disconnect is not in the immediate vicinity of the meter, please include the disconnect location on the meter signage. This enables the utility and first responders to more quickly deal with an emergency situation.

Is the inverter IEEE/UL1741 lab certified? Yes ☒ No ☐

(If yes, attach manufacturer's cut sheet showing listing and label information from the appropriate listing authority, e.g. UL 1741 listing. If no, facility is not eligible for Level 1 Application.)

Does the Customer own their own transformer, but primary service is from DPL? ☐ Yes ☒ No

If yes, complete the following electric service information for customer facility where generator will be interconnected:

Capacity: _____ Amps Voltage: _____ Volts

Type of Service: ☐ Single Phase ☐ Three Phase

If 3 Phase Transformer, Indicate Type

Primary Winding ☐ Wye ☐ Delta ☐ Grounded Wye

Secondary Winding ☐ Wye ☐ Delta ☐ Grounded Wye

Transformer Size: _____ kVA Impedance: _____ %

Generator & Prime Mover Data (if applicable):

Energy Source: Solar PV Energy Converter Type: Photovoltaic Cell

Generator Size(s) (kW or kVA): 15 Number of Generator Units: 1

Total Electrical Generation Capacity (kW or kVA): 15

Generator Type: ☐ Induction ☒ Inverter ☐ Synchronous ☐ Other: _____

Small Generator Facility Information (if applicable):

List interconnection components/system(s) to be used in the Small Generation Facility that are lab certified (required for Level 2 Interconnection requests only).

Component/System

NRTL Providing Label & Listing

1. SolarWorld 285w MONO UL 1

2. Fronius PRIMO 15 UL 1741

3. _____

4. _____

5. _____

Please provide copies of manufacturer brochures or technical specifications

Energy Production Equipment/Inverter Information:

☐ Synchronous ☐ Induction ☒ Inverter ☐ Other _____

Rating: 15 kW Rating: 15000 kVA

Rated Voltage: 240 Volts

Rated Current: 62.5 Amps

System Type Tested (Total System): ☒ Yes ☐ No; attach product literature

For Synchronous Machines: (Note: Contact EDC to determine if all the information requested in this section is required for the proposed small generator facility.)

Manufacturer: _____

Model No. _____ Version No. _____

Submit copies of the Saturation Curve and the Vee Curve

¹⁴ Yes, if your expected maximum output of the inverter (kW AC) is greater than the lowest load you anticipate at your facility during maximum PV output (kW). The difference would be the amount you may export.

☐ Salient ☐ Non-Salient

Torque: _____ lb-ft Rated RPM: _____ Field Amperes: _____ at rated
generator voltage and current and _____ % PF over-excited

Type of Exciter: _____

Output Power of Exciter: _____

Type of Voltage Regulator: _____

Locked Rotor Current: _____ Amps Synchronous Speed: _____ RPM

Winding Connection: _____ Min. Operating Freq./Time: _____

Generator Connection: ☐ Delta ☐ Wye ☐ Wye Grounded

Direct-axis Synchronous Reactance: (X_d) _____ ohms

Direct-axis Transient Reactance: (X'_d) _____ ohms

Direct-axis Sub-transient Reactance: (X''_d) _____ ohms

Negative Sequence Reactance: _____ ohms

Zero Sequence Reactance: _____ ohms

Neutral Impedance or Grounding Resister (if any): _____ ohms

For Induction Machines: (Note: Contact EDC to determine if all the information requested in this section is required for the proposed small generator facility.)

Manufacturer: _____

Model No. _____ Version No. _____

Locked Rotor Current: _____ Amps

Rotor Resistance (R_r) _____ ohms Exciting Current _____ Amps

Rotor Reactance (X_r) _____ ohms Reactive Power Required: _____

Magnetizing Reactance (X_m) _____ ohms _____ VARs (No Load)

Stator Resistance (R_s) _____ ohms _____ VARs (Full Load)

Stator Reactance (X_s) _____ ohms

Short Circuit Reactance (X''_d) _____ ohms

Phases: ☐ Single ☐ Three-Phase

Frame Size: _____ Design Letter: _____ Temp. Rise: _____ °C.

Reverse Power Relay Information (Level 3 Review Only):

Manufacturer: _____

Relay Type: _____ Model Number: _____

Reverse Power Setting: _____

Reverse Power Time Delay (if any): _____

ADDITIONAL INFORMATION

DC Source / Prime Mover:

Rating: _____ kW Rating: _____ kVA

Rated Voltage: _____ Volts

Open Circuit Voltage (If applicable): 571 _____ Volts

Rated Current: _____ Amps

Short Circuit Current (If applicable): 49.2 _____ Amps

EQUIPMENT INSTALLATION CONTRACTOROwner (Customer) Installed: ☐ Yes ☒ NoContractor Name: Alutech United IncMailing Address: 117 Dixon STCity: Selbyville State: DE Zip Code: 19975Contact Person: Haleigh TingleTelephone (Daytime): (800) 834-5196 (Evening): (302) 841-9059Fax Number: (302) 436-5100 E-Mail Address (Required): haleigh@greenstreetsolar.com**ELECTRICAL CONTRACTOR**Electrical Contractor Name: Same as equipment Contractor

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Contact Person: _____

Telephone (Daytime): _____ (Evening): _____

Fax Number: _____ E-Mail Address: _____

License number: TL-0005686**INSURANCE DISCLOSURE**

The attached terms and conditions contain provisions related to liability and indemnification, and should be carefully considered by the interconnection customer. The interconnection customer is not required to obtain general liability insurance coverage as a precondition for interconnection approval; however, the interconnection customer is advised to consider obtaining appropriate insurance coverage to cover the interconnection customer's potential liability under this agreement.

CUSTOMER SIGNATURE

I hereby certify that: 1) I have read and understand the terms and conditions which are attached hereto by reference and are a part of this Agreement; 2) I hereby agree to comply with the attached terms and conditions; and 3) to the best of my knowledge, all of the information provided in this application request form is complete and true. I consent to permit the PSC and interconnecting utility to exchange information regarding the generating system to which this application applies.

Interconnection Customer Signature: Michael Galanda Date: 5/22/16Printed Name: Michael Galanda Title: Homeowner



PART 2

DELAWARE LEVEL 2, 3, & 4 INTERCONNECTION APPLICATION & AGREEMENT

With Terms and Conditions for Interconnection
(Review of Small Generator Facilities Less than or Equal to 10 MW¹⁵)

(Final Agreement –must be completed after installation and prior to interconnection)

Certificate of Completion¹⁶

INTERCONNECTION CUSTOMER CONTACT INFORMATION

Customer Name: Michael Galanda
Mailing Address: 44 Sioux DR
City: Millsboro State: DE Zip Code: 19966
Telephone (Daytime): (570) 407-1157 (Evening): _____
Fax Number: _____ E-Mail Address: beach2141@hotmail.com

FACILITY INFORMATION

Facility Address: 44 Sioux DR
City: MILLSBORO State: DE Zip Code: 19966
DPL Account #: 55012158691 Meter #: 1ND040473575 (Required by DPL)
Energy Source: Solar PV Prime Mover: Photovoltaics
Inverter Type: Forced Commutated ☐ Line Commutated ☐ Number of Inverters: 1
Inverter Manufacturer: Fronius Model Number(s) of Inverter: PRIMO 15.0

Rating DC Generator Total¹⁷ Nameplate Rating: 15.105 (kW),
AC Inverter Total¹⁸ Rating 15 (kW),
AC System Design Total Capacity¹⁹: 15 (kW) 15000 (kVA)

Generator (or PV Panel) Manufacturer, Model #: SolarWorld 285w MONO

¹⁵ Up to 2 MW for Net Energy Metering.

¹⁶ Information entered here on Certificate of Completion (Part 2) must match part 1

¹⁷ Sum of all generators or PV Panels

¹⁸ Sum of all inverters

¹⁹ This will be your system design capacity based upon your unique system variables.

EQUIPMENT INSTALLATION CONTRACTOR Owner (Customer) Installed: ☐ Yes ☒ No

Name: Alutech United Inc

Mailing Address: 117 Dixon ST

City: Selbyville

State: DE

Zip Code: 19975

Contact Person: Haleigh Tingle

Telephone (Daytime): (800) 834-5196

(Evening): (302) 841-9059

Fax Number: (302) 436-5100

E-Mail Address: haleigh@greenstreetsolar.com

FINAL ELECTRIC INSPECTION AND INTERCONNECTION CUSTOMER SIGNATURE

The Small Generator Facility is complete and has been approved by the local electric inspector having jurisdiction. A signed copy of the electric inspector's form indicating final approval is attached. The Interconnection Customer acknowledges that it shall not operate the Small Generator Facility until receipt of the final acceptance and approval by the EDC as provided below.

Signed:

Michael G. Lusk
(Signature of interconnection)

Date 5/22/16

Printed Name:

Michael Galanda

Check if copy of signed electric inspection form is attached (required) ☒

Check if copy of as built documents is attached (projects larger than 10 kW only) ☐

ACCEPTANCE AND FINAL APPROVAL FOR INTERCONNECTION (for EDC use only)

The interconnection agreement is approved and the Small Generator Facility is approved for interconnected operation upon the signing and return of this Certificate of Completion by EDC:

Electric Distribution Company waives Witness Test? (Initial) Yes (HC) No ()

If not waived, date of successful Witness Test: _____ Passed: (Initial) ()

EDC Signature: _____ Date: 8/3/2016

Printed Name: Harry Cabell

Title: Acct Coordinator

First State Inspection Agency, Inc.
1001 Mattlind Way
Milford, DE 19963

1-800-468-7338
302-422-3859

Alutech United, Inc.
James Rodrigue
PO Box 329
Selbyville, DE 19975

CERTIFICATE

Final Inspection Date:	7/18/2016
Application #:	025202
Owner:	Michael Galanda
Customer Job #:	
Occupancy:	Solar
Location:	44 Sioux Drive, Millsboro, Sussex Co., DE

This certifies that the installation of electrical equipment listed on referenced application has been approved as meeting the requirements of the National Electric Code, utility, municipalities and Agency rules. Any modification, addition or alteration of the electrical system, after the date of final inspection, will require a new application for inspections and certifications.


Chief Electrical Inspector



**DELAWARE STANDARD AGREEMENT FOR INTERCONNECTION OF SMALL
GENERATOR FACILITIES WITH A CAPACITY GREATER THAN 10 kW AND LESS THAN
OR EQUAL TO 10 MW¹**

This agreement ("Agreement") is made and entered into this 20th day of May by and between Michael Galanda, ("Interconnection Customer," a Individual² organized and existing under the laws of the State of Delaware, and Delmarva Power & Light Company, ("Electric Distribution Company", (EDC)) a Corporation existing under the laws of the State of Delaware. Interconnection Customer and EDC each may be referred to as a "Party," or collectively as the "Parties."

Recitals:

Whereas, Interconnection Customer is proposing to, install or direct the installation of a Small Generator Facility, or is proposing a generating capacity addition to an existing Small Generator Facility, consistent with the Interconnection Request completed by Interconnection Customer on May 20 2016; and

Whereas, the Interconnection Customer will operate and maintain, or cause the operation and maintenance of the Small Generator Facility; and

Whereas, Interconnection Customer desires to interconnect the Small Generator Facility with EDC's Electric Distribution System.

Now, therefore, in consideration of the premises and mutual covenants set forth herein, and other good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, the Parties covenant and agree as follows:

1. Scope and Limitations of Agreement

- 1.1. This Agreement shall be used for all approved Level 2, Level 3 and Level 4 Interconnection Requests according to the procedures set forth in the Delaware Standard Small Generator Interconnection Rules, Title 26 - Public Utilities – Chapter 10. Electric Utility Restructuring §1014.
- 1.2. This Agreement governs the terms and conditions under which the Small Generator Facility will interconnect to, and operate in Parallel with, the EDC's Electric Distribution System.
- 1.3. This Agreement does not constitute an agreement to purchase or deliver the Interconnection Customer's power.

¹ Applicable for non-inverter based units less than 10 kW. Up to 2 MW for Net Energy Metering.

² Choices: Individual, Sole Proprietorship, Partnership, Corporation, Limited Liability Company, Municipal Agency, State Agency, Federal Agency, or Non-Profit.

EDC's Operating Representative: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

- 10.4. Changes to the Notice Information: Either Party may change this notice information by giving five business days written notice prior to the effective date of the change.

11. Signatures

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized representatives.

For the Interconnection Customer:

Signature: Michael Galanda

Name: Michael Galanda

Title: Homeowner

Date: 5/20/16

For EDC:

Signature: _____

Name: Harry Cabell

Title: Acct Coordinator

Date: 8/3/2016